

Amendments to the Claims

The following listing of claims will replace all prior versions, and listings, of claims in the present application:

Please cancel claims 1-12 and add new claims 13-49 as follows:

1-12. (canceled)

13. (new) A sol-gel process for producing a metal oxide particle comprising
  - a) providing a mixture comprising a halogen-containing target molecule and a polyhalogenated metal alkylalkoxy compound;
  - b) starting a sol-gel process with an initial amount of a metal oxide precursor;
  - c) adding the mixture from a); and
  - d) ending the sol-gel process.
14. (new) The sol-gel process of claim 13 further comprising adding an additional amount of the metal oxide precursor before step d).
15. (new) The sol-gel process of claim 14, wherein the initial amount of the metal oxide precursor used in step b) is between about 90 and about 10 % and the additional amount of the metal oxide precursor is between about 10 and about 90 %..
16. (new) The sol-gel process of claim 14, wherein the initial amount of the metal oxide precursor used in step b) is between about 75 and about 25 % and the additional amount of the metal oxide precursor is between about 25 and about 75 %.

17. (new) The sol-gel process of claim 13, wherein the time period for starting the sol-gel process in step b) is variable.
18. (new) The sol-gel process of claim 13, wherein the time period for starting the sol-gel process in step b) is less than about 1 hour.
19. (new) The sol-gel process of claim 13, wherein the time period for starting the sol-gel process in step b) is between about 1 and about 20 minutes.
20. (new) The sol-gel process of claim 13, wherein the time period for starting the sol-gel process in step b) is between about 2 and about 10 minutes.
21. (new) The sol-gel process of claim 13, wherein based on the initial amount of the metal oxide precursor between about 0.04 and about 0.4 mol % of the polyhalogenated metal alkylalkoxy compound is used.
22. (new) The sol-gel process of claim 13, wherein based on the initial amount of the metal oxide precursor between about 0.1 and about 0.3 mol % of the polyhalogenated metal alkylalkoxy compound is used.
23. (new) The sol-gel process of claim 13, wherein the halogen-containing target molecule comprises between about 5 and about 65 weight % halogen.
24. (new) The sol-gel process of claim 13, wherein the halogen-containing target molecule comprises between about 15 and about 50 weight % halogen.
25. (new) The sol-gel process of claim 13, wherein the halogen-containing target molecule has a molecular weight between about 250 and about 5000 Dalton.

26. (new) The sol-gel process of claim 13, wherein the halogen-containing target molecule has a molecular weight between about 300 and about 4000 Dalton.
27. (new) The sol-gel process of claim 13, wherein the halogen-containing target molecule has a molecular weight between about 400 and about 3000 Dalton.
28. (new) The sol-gel process of claim 13, wherein based on the initial amount of the metal oxide precursor between about 0.1 and about 10 % by weight of the target molecule is used.
29. (new) The sol-gel process of claim 13, wherein based on the initial amount of the metal oxide precursor between about 0.2 and about 5 % by weight of the target molecule is used.
30. (new) The sol-gel process of claim 13, wherein the halogen-containing target molecule is chlorinated.
31. (new) The sol-gel process of claim 13, wherein the halogen-containing target molecule is fluorinated.
32. (new) The sol-gel process of claim 13, wherein the metal oxide is selected from  $B_2O_3$ ,  $Al_2O_3$ ,  $SiO_2$ ,  $SnO_2$ ,  $ZrO_2$ ,  $TiO_2$ , or combinations thereof.
33. (new) The sol-gel process of claim 14, wherein the adding an additional amount of the metal oxide precursor provides a metal oxide surface coating for the metal oxide particle.
34. (new) The sol-gel process of claim 33, wherein the metal-oxide surface coating is chemically protective.

35. (new) The sol-gel process of claim 33, wherein the metal-oxide surface coating is colorless.
36. (new) The sol-gel process of claim 33, wherein the metal-oxide surface coating is between about 1 and about 30 nm thick.
37. (new) The sol-gel process of claim 33, wherein the metal-oxide surface coating is between about 2 and about 20 nm thick.
38. (new) The sol-gel process of claim 13 further comprising providing at least one functional group.
39. (new) The sol-gel process of claim 38, wherein the functional group is selected from carbonyl groups, amino groups, epoxy groups, hydroxyl groups, or thiol groups.
40. (new) A metal oxide particle produced by the sol-gel process of claim 13.
41. (new) The metal oxide particle of claim 40 further comprising at least one biomolecule coupled thereto forming a conjugate.
42. (new) The metal oxide particle of claim 41, wherein the biomolecule is selected from proteins, glycoproteins, peptides, nucleic acids, peptidic nucleic acids, saccharides, hormones, haptens, vitamins, naturally occurring binding partners, artificially produced binding partners, antigens, and combinations thereof.
43. (new) The metal oxide particle of claim 41, wherein the biomolecule is selected from antibodies and fragments thereof.

44. (new) The metal oxide particle of claim 43, wherein the antibody is selected from monoclonal antibodies, polyclonal antibodies, chimeric antibodies, and fragments thereof.
45. (new) The metal oxide particle of claim 41, wherein the biomolecule is selected from streptavidin, avidin, biotin, and combinations thereof.
46. (new) The metal oxide particle of claim 40, wherein the particle is a label for a biomolecule.
47. (new) The metal oxide particle of claim 40, wherein the particle is a sunscreen agent.
48. (new) The metal oxide particle of claim 40, wherein the particle is a toner.
49. (new) The metal oxide particle of claim 40, wherein the particle comprises an insecticide.